

1     **MECHANICAL CRAYON PEN WITH AN INTERNAL CARTRIDGE**  
2                     **FOR MULTIPLE CRAYON STICKS**

3     **BACKGROUND OF THE INVENTION**

4     1. Field of the Invention

5             The invention relates to a mechanical crayon pen, and particularly to  
6     a mechanical crayon that has an internal cartridge to hold multiple crayon  
7     sticks inside so a particular colored crayon can be conveniently and quickly  
8     installed in the crayon pen.

9     2. Description of Related Art

10            With reference to Fig. 7, a conventional mechanical crayon pen has a  
11     barrel (50) and multiple sectional sleeves (52). The barrel (50) has a bottom  
12     outlet (not numbered) and a top inlet (not numbered). The multiple sectional  
13     sleeves (52) are slidably stacked inside the barrel (50). Each sleeve (52) has a  
14     short crayon stick (51) mounted in and protruding from the sleeve (52). Only  
15     the sleeve (52) and crayon stick (51) at the bottom outlet of the barrel (50) be  
16     seen and used to draw.

17            The crayon stick (51) is changed by pulling the sectional sleeve (52)  
18     at the bottom outlet out of the barrel (50) and pressing it into the top inlet  
19     until a desired crayon stick (51) appears at the bottom outlet. The  
20     conventional mechanical crayon pen has the following drawbacks:

21            1. The sectional sleeves (52) with the short crayon sticks (51) are not  
22     sold individually. When one of the crayon sticks (51) is used up or one of the  
23     sectional sleeves (52) is lost, a complete set of new sectional sleeves (52)  
24     with the short crayon sticks (51) must be bought to complete the selection of

1 colors in the conventional mechanical crayon pen. The unused sectional  
2 sleeves (52) with the short crayon sticks (51) are a waste for the user.

3 2. Because the sectional sleeves (52) are stacked inside the barrel (50)  
4 in sequence and a specific crayon stick (51) cannot be selected directly,  
5 individual sectional sleeves (52) must be removed from and replaced in the  
6 barrel (50) one by one until the desired crayon stick (51) appears. Therefore,  
7 exposing the desired color stick (51) is troublesome.

8 Another conventional mechanical crayon pen incorporates features  
9 of a mechanical pencil and multiple crayon sticks to change the crayon sticks  
10 easily. However, the crayon sticks are stored in a separate case. Hence, the  
11 user has to carry the mechanical crayon pen with the separate case of crayon  
12 sticks to be able to draw with different colors.

13 The present invention has arisen to provide a mechanical crayon pen  
14 to obviate the foregoing drawbacks of conventional mechanical crayon pens.

#### 15 SUMMARY OF THE INVENTION

16 The main objective of the present invention is to provide a  
17 mechanical crayon pen with an internal cartridge to hold multiple colored  
18 crayon sticks from which a particular colored crayon stick can be  
19 conveniently and quickly installed.

20 Further benefits and advantages of the present invention will become  
21 apparent after a careful reading of the detailed description in conjunction  
22 with the drawings.

#### 23 BRIEF DESCRIPTION OF THE DRAWINGS

24 Fig. 1 is an exploded perspective view of a mechanical crayon pen

1 with an internal cartridge for multiple crayon sticks in accordance with the  
2 present invention;

3 Fig. 2 is a side plan view in partial section of the mechanical crayon  
4 pen in Fig. 1;

5 Fig. 3 is a side plane view in partial section of the mechanical crayon  
6 pen in combination;

7 Fig. 4 is a cross-sectional top plan view of the mechanical crayon  
8 pen along line 4-4 in Fig. 3;

9 Fig. 5 is a cross-sectional top plan view of another embodiment of  
10 the mechanical crayon pen in accordance with the present invention, wherein  
11 the mechanical crayon pen further has a dividing wall formed within the  
12 internal cartridge;

13 Fig. 6 is a cross-sectional top plan view of still another embodiment  
14 of the mechanical crayon pen, wherein the mechanical crayon pen further has  
15 a dividing wall formed within the internal cartridge and multiple recesses are  
16 defined on an outer surface of the dividing wall; and

17 Fig. 7 is a side plan view of a conventional mechanical crayon pen in  
18 accordance with the prior art.

#### 19 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

20 A mechanical crayon pen with an internal cartridge for multiple  
21 crayon sticks comprises a transparent barrel, a thrust device, a thrust actuator  
22 and a multiple-crayon cartridge. The transparent barrel has an open top, a  
23 bottom tip and an inner surface. The thrust device is mounted inside the  
24 transparent barrel, causes an indexed crayon stick to protrude from the

1 transparent barrel and holds the indexed crayon stick in place. The thrust  
2 actuator is mounted on the open top of the transparent barrel, and the  
3 multiple-crayon cartridge is formed between the transparent barrel and the  
4 thrust device.

5 With reference to Figs. 1 to 4, an embodiment of the mechanical  
6 crayon in accordance with the present invention comprises a transparent  
7 barrel (10), a thrust device (20), a thrust actuator (30) and a multiple-crayon  
8 cartridge (not numbered) to hold multiple colored crayon sticks (40).

9 The transparent barrel (10) is a tube with an open top (12), a bottom  
10 tip (11), an inner diameter (not numbered), an outer diameter (not numbered)  
11 and an inner surface (not numbered). The inner surface may have multiple  
12 longitudinal grooves (14) respectively to hold the crayon sticks (40) in place.

13 The thrust device (20) has an inner tube (21), a hollow shaft (24), a  
14 clutch ring (23) and a spring (22) around the hollow shaft (24) near the  
15 bottom tip. The inner tube (21) is movably mounted inside the transparent  
16 barrel (10), has an outer surface (not numbered), an outer diameter (not  
17 numbered), a top end (not numbered) and a bottom end (not numbered) and  
18 can hold a single crayon stick (40) inside the inner tube (21). The outer  
19 diameter of the inner tube (21) is significantly smaller than the inner  
20 diameter of the transparent tube (10) so that a space (13) is formed between  
21 the inner surface of the transparent barrel (10) and the inner tube (21). The  
22 hollow shaft (24) has a top end and a bottom end and is attached to the inner  
23 tube (21) by pressing the top end of the hollow shaft (24) into the bottom end  
24 of the inner tube (21). The clutch ring (23) is attached to the bottom end of

1 the hollow shaft (24) and is held in the transparent barrel (10) by the bottom  
2 tip (11). The spring (22) is mounted around the hollow shaft (24) between the  
3 inner tube (21) and the clutch ring (23) to provide restitution force to the  
4 inner tube (21). The clutch ring (23) and its operation are conventional.  
5 Therefore, no further descriptions of the structure and operation of the clutch  
6 ring (23) are provided.

7 The thrust actuator (30) is mounted detachably on the open top (12)  
8 of the transparent barrel (10) and has a cap (32), a pushbutton (31), and a  
9 recoiling spring (34). The cap (32) is a disk and has a top face, a bottom face,  
10 a central hole (321), an annular flange (not numbered), an access (322) and  
11 an optional clip (324). The central hole (321) is defined in the top face and  
12 the access (322) is also defined in the top face to communicate with the  
13 central hole (321). The access (322) allows a single colored crayon stick  
14 passing through. The annular flange is formed on the bottom face of disk and  
15 has an inner diameter slightly smaller than the outer diameter of the  
16 transparent barrel (10) so the cap (32) can be detachably and rotatably  
17 mounted on the transparent barrel (10). The clip (324) is downward formed  
18 at edge of the cap (32) to secure the mechanical crayon pen. The push button  
19 (31) is detachably mounted on the cap (32) and has a head (314), a column  
20 (313), and an abutting shaft (312). The head (314) is a round disk and the  
21 column (313) with a bottom face is attached under the disk. The abutting  
22 shaft (312) is attached on the bottom face of the column (313) and protrudes  
23 into the inner tube (21). The recoiling spring (34) is mounted around the  
24 abutting shaft (312) to cover the access (322) on the cap (32) and provides a

1 restitution force to the push button (31).

2           With reference to Figs. 4 to 6, the multiple-crayon cartridge  
3 comprises the space (13) between the inner surface of the transparent barrel  
4 (10) and the outer surface of the inner tube (21) of the thrust device (20) and  
5 optional longitudinal grooves (14, 152). In Fig. 4, the optional longitudinal  
6 grooves (14) are formed on the inner surface of the transparent barrel (10) to  
7 define multiple compartments for individual colored crayon sticks (40). In  
8 Figs. 5 and 6, the mechanical crayon pen in accordance with the present  
9 invention further has a dividing wall (15) with an outer surface formed  
10 within the space (13) to diminish the compartments to avoid the colored  
11 crayon sticks (40) shaking in the cartridge to become scratched or broken.  
12 Meanwhile, residuum peeled from the colored crayon sticks (40) is enclosed  
13 between the dividing wall (15) and the transparent barrel (10) so that the  
14 clutch ring (23) of the thrust device (20) has no chance to be jammed by the  
15 residuum. Selectively, the optional longitudinal grooves (14, 152) are formed  
16 on the inner surface of the transparent barrel (10) or the outer surface of the  
17 dividing wall (15) to defined the multiple compartments. The crayon sticks  
18 (40) are stored inside the multiple-crayon cartridge and individually in the  
19 optional longitudinal grooves (14, 152) and can be seen through the  
20 transparent barrel (10). Therefore, a user can locate the position of a desired  
21 color crayon stick (40) and rotate the cap (32) to align the access (322) with  
22 the desired color crayon stick (40). The push button (31) and the recoiling  
23 spring are detached from the cap (32) to expose the access (322) to allow  
24 only the desired color crayon stick (40) to be removed. Then, the desired

1 color crayon strip (40) is installed in the inner tube (21) through the central  
2 hole (321) on the cap (32).

3 Based on the foregoing description, the mechanical crayon in  
4 accordance with the present invention has the following advantages:

5 1. The colored crayon sticks (40) are stored inside the cartridge in the  
6 transparent barrel (10), which eliminates the need for a separate crayon case  
7 as used with conventional mechanical crayon pens.

8 2. The colored crayon sticks (40) can be sold individually to satisfy a  
9 consumer's requirement for a single colored crayon stick (40).

10 3. A desired color crayon stick (40) can be selected and taken out of  
11 the mechanical crayon pen through the access (322) on the cap (32) and  
12 conveniently and quickly loaded into the inner tube (21).

13 Although the invention has been explained in relation to its preferred  
14 embodiment, many other possible modifications and variations can be made  
15 without departing from the spirit and scope of the invention as hereinafter  
16 claimed.